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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS, 2019/2020 ACADEMIC YEAR
FOURTH YEAR, SECOND SEMESTER EXAMINATIONS
FOR THE DEGREE OF BACHELOR OF SCIENCE
(COMPUTER SCIENCE)

Date: 8th April, 2019
Time: 11.00am – 1.00pm

KCS 409 - TRANSACTION PROCESSING AND DISTRIBUTED SYSTEMS

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Why would you design a system as a distributed system? List some advantages of distributed systems? (4 Marks)
- b) Consider a distributed environment of four systems, A,B,C and D. Name the types of transparencies required in each of the following situations;
- i) Data available at all systems and user want to modify data at D.
 - ii) Printer connected to A is disconnected and connected to B. User wants to access that printer.
 - iii) Breakdown of system D.
 - iv) User wants to access the software X without knowing its whereabouts. (8 Marks)
- c) List any two situations which clearly show the need for distributed coordination. How is it achieved? (2 Marks)
- d) What is the advantage if your server-side processing uses threads instead of a single process? (3 Marks)
- e) List three properties of distributed systems (3 Marks)
- f) Give a definition of middleware and show in a small diagram where it is positioned. (3 Marks)
- g) What kinds of issues need to be addressed in a distributed system consisting of different processors and different operating systems? (3 Marks)
- h) Explain why it might be a problem to detect failure in a distributed system. (2 Marks)
- i) Explain why distributed systems are inherently insecure (2 Marks)

QUESTION TWO (20 MARKS)

- a) Using relevant examples state and explain TEN advantages and disadvantages of a distributed system over:
- i) A centralized system. (5 Marks)
 - ii) A stand- alone system. (5Marks)
- b) Explain the term Transparency and explain TEN forms of transparency. (10 Marks)

QUESTION THREE (20 MARKS)

- a) Some p2p systems avoid central servers completely. State and explain five advantages and five disadvantages of this architecture? (10 Marks)
- b) Explain the term Synchronization, why it is important in Distributed Systems and how it is done. (6 Marks)
- c) Explain how a distributed DBMS architecture works. (4 Marks)

QUESTION FOUR (20 MARKS)

A local bank wants to set up a countrywide ATM system in its expansion plan;

- a) Discuss the motivating factors for this system. (4 Marks)
- b) Highlight the factors they should consider in the design of the system. (6 Marks)
- c) Discuss the possible challenges they are likely to face in its implementation indicating how to solve them. (10 Marks)

QUESTION FIVE (20 MARKS)

- a) Explain the term encryption. Explain the role of encryption in securing distributed systems. (6 Marks)
- b) You have been appointed to advise Kiriri Womens' University on security issues related to its plan of setting up and implementing a campus wide system to facilitate its day to day operations. Explain the security threats that system is likely to face and measures to be put in place to counter them. (6 Marks)
- c) Your IT department wants to use the services of Cloud Computing offered by Safaricom, a leading telecommunication service provider in Kenya. Explain what cloud computing is and the benefits that your IT department will derive from that arrangement (8 Marks)